

# ENVIRONMENTAL ASSESSMENT

APPLICANT: CR KENDALL CORPORATION

TYPE OF OPERATION: OPEN PIT / CYANIDE HEAP LEACH GOLD - SILVER MINE

LOCATION: T 18 N, R 18 E, Section 29

COUNTY: FERGUS

PERSON PREPARING E.A.: WAYNE JEPSON

APPLICATION COMPLETE: JANUARY 13, 1993  
Date

E.A. COMPLETE: JANUARY 21, 1993  
Date

				POTENTIAL IMPACTS		
	A	A	C	LONG TERM	SHORT TERM	AMPLIFICATION
<b>PHYSICAL ENVIRONMENT</b>						
1. <u>TOPOGRAPHY</u>			X	X		SEE DISCUSSION
2. <u>GEOLOGY</u> ; Stability			X			SEE DISCUSSION
3. <u>SOILS</u> ; Quality, Distribution			X			
4. <u>WATER</u> ; Quality; Quantity; Distribution			X			SEE DISCUSSION
5. <u>AIR</u> ; Quality			X			STATE DOCUMENTS COLLECTION
6. <u>UNIQUE, ENDANGERED, FRAGILE, or LIMITED</u> environmental resources			X			MAR 13 1993 MONTANA STATE LIBRARY 1515 E. 6TH AVE. HELENA, MONTANA 59620
<b>BIOLOGICAL ENVIRONMENT</b>						
1. <u>TERRESTRIAL, AVIAN, and AQUATIC</u> ; species and habitats			X			
2. <u>VEGETATION</u> ; quantity, quality, species			X	X		SEE DISCUSSION
3. <u>AGRICULTURE</u> ; grazing, crops production			X			
<b>HUMAN ENVIRONMENT</b>						
1. <u>SOCIAL</u> ; structures and mores			X			
2. <u>CULTURAL</u> uniqueness, diversity			X			
3. <u>POPULATION</u> ; quantity and diversity			X			
4. <u>HOUSING</u> ; quantity and distribution			X			
5. <u>HUMAN HEALTH &amp; SAFETY</u>			X			



				POTENTIAL IMPACTS		
	A	B	C	LONG TERM	SHORT TERM	AMPLIFICATION
6. <u>COMMUNITY &amp; PERSONAL INCOME</u>			X			
7. <u>EMPLOYMENT</u> ; quantity and distribution			X			
8. <u>TAX BASE</u> ; local and state tax revenue			X			
9. <u>GOVERNMENT SERVICES</u> ; demand			X			
10. <u>INDUSTRIAL, COMMERCIAL</u> and <u>AGRICULTURAL</u> activities			X			
11. <u>HISTORICAL</u> and <u>ARCHAEOLOGICAL</u>			X			
12. <u>AESTHETICS</u>			X	X		SEE DISCUSSION
13. <u>ENVIRONMENTAL PLANS</u> and <u>GOALS</u> ; local and regional			X			
14. <u>DEMANDS</u> on <u>ENVIRONMENTAL RESOURCES</u> of land, water, air and energy			X			
15. <u>TRANSPORTATION</u> ; networks and traffic flows			X			

PUBLIC INVOLVEMENT: TWO WEEK PUBLIC REVIEW OF DRAFT ENVIRONMENTAL ASSESSMENT

CUMULATIVE EFFECTS: NONE. LEVEL OF DISTURBANCE REDUCED: NO CONCURRENT PROPOSALS.

ALTERNATIVES CONSIDERED: DENIAL OF DUMP RELOCATION: SEE ATTACHED DISCUSSION

COMPLIANCE STATUS: CR KENDALL IS IN COMPLIANCE WITH OPERATING PERMIT 00122

RECOMMENDATIONS CONCERNING PREPARATION OF AN EIS: AN EIS IS NOT NECESSARY FOR THIS LEVEL OF DISTURBANCE.

OTHER GROUPS OR AGENCIES CONTACTED OR WHICH MAY HAVE OVERLAPPING JURISDICTION:

BUREAU OF LAND MANAGEMENT, WATER QUALITY BUREAU.

INDIVIDUALS CONTRIBUTING TO THIS EA: WAYNE JEPSON, PETER WERNER, BOB WINEGAR.

A: Significant Unavoidable Impacts

B: Insignificant as a result of conditioned mitigation

C: Insignificant as proposed

Robert C. Winegar  
Signature



## CR KENDALL CORPORATION

### AMENDMENT #6 TO OPERATING PERMIT #00122

#### PROPOSED PLAN

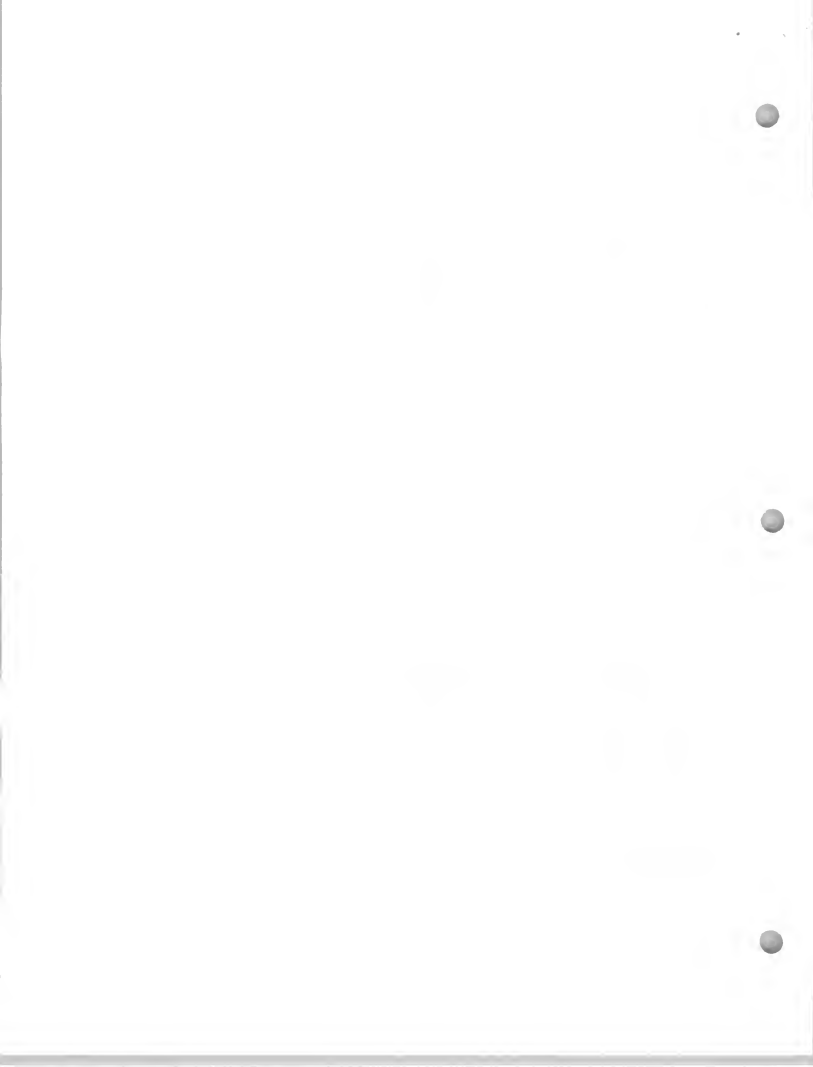
**History:** CR Kendall Corporation is operating an open pit gold mine in Fergus County, Montana. The original operating permit was issued after preparation of a Preliminary Environmental Review (DSL, 1984). Since issuance, five amendments have been approved. In February 1989, CR Kendall provided the agencies with a comprehensive life-of-mine proposal. That amendment (#4) was approved, following completion of an Environmental Assessment in September, 1989. Since then the permit has been amended (June, 1992) to allow for relocation of a land application area.

**Current Proposal:** On December 18, 1992, CR Kendall notified the Montana Department of State Lands of the company's desire to modify their operating permit to allow relocation of the waste rock dump associated with the Horseshoe Pit. Exploration conducted since 1989 has revealed that the volume of ore in the Horseshoe ore body is considerably less than originally estimated. As a result, the Horseshoe Pit will be of smaller size and the estimated amount of waste rock to be placed in the Horseshoe waste rock dump has been reduced from 9,000,000 tons to 1,800,000 tons. The reduced volume allows for placement of this waste within the Little Dog Creek drainage to the south of the pit, rather than in the permitted waste dump area to the north of the Horseshoe deposit. The relocated dump would remain entirely within the existing permit boundary.

The elevation of the upstream portion of the dump would be 4618'. The dump surface would have a two percent gradient to the north and east for approximately 1500 feet, to facilitate drainage. The east face of the dump will be constructed at a 4:1 slope (25 percent) with ten foot wide benches every 200 feet of slope length to provide access for reclamation and to prevent erosion. At the toe of the 4:1 slope, existing tailing material will be excavated down to a competent foundation prior to waste rock placement in order to provide long-term stability. Any surface water traversing Little Dog Creek will be channelled through a constructed surface water diversion across the dump surface and down the north side of the dump face. This channel has been designed to accommodate a 100-yr, 24-hr storm event. A groundwater monitoring site will be established downgradient of the dump.

#### RECLAMATION PLAN:

Upon completion of waste rock dump construction, the dump will be contoured, topsoiled, and reclaimed. The dump surface



will slope to the north and east. A channel with the capacity of handling a 120 cfs discharge would be constructed along the north side of the dump. This channel will typically be 18 feet across and 3 feet deep, with 3:1 side-slopes and appropriately sized rip rap to prevent channel erosion. The channel will have a two percent gradient until it reaches the east face of the dump. The channel will then drop along the edge of the dump face to the existing, undisturbed drainage at an approximate gradient of 20 percent. Dump reclamation will remain consistent with parameters outlined in the 1989 Plan of Operations.

#### POTENTIAL IMPACTS AMPLIFICATION

**Topography:** The currently permitted Horseshoe waste disposal area is located on a northeast facing slope, north of the Horseshoe deposit. CR Kendall is permitted to disturb 29.4 acres of grassland and forest with this dump. Relocation of the dump to the south of the pit would disturb only 19.3 acres. The proposed valley-fill dump would have a more subdued, natural appearing topography than the permitted dump would.

**Geology; Stability:** The dump relocation and surface water diversion would cover the existing tailing deposit, thereby preventing the erosion and downstream migration of these tailings. Mobilization of the waste material and underlying tailings will be further inhibited by the construction of a foundation keyway at the dump toe, and by reclaiming the dump face at a 4:1 slope. Stability of this dump design is indicated by the performance of the existing Muleshoe Waste Rock Dump, which is also constructed over a deposit of old tailings.

**Water:** Little Dog Creek is an ephemeral drainage located on the eastern side of the North Moccasin Mountains. Flow in this drainage occurs in response to snowmelt and major precipitation events. The drainage area upstream of the proposed disturbance encompasses 426 acres. It has been estimated that a 100 year - 24 hour storm event (3.8 inches of precipitation) would result in a peak discharge of 98 cubic feet per second (cfs). Actual discharge may be less due to the high permeability of the bedrock Madison Limestone aquifer in the area.

CR Kendall's surface water monitoring site KVSU-1 is located on Little Dog Creek, below the historic tailings. This site (established in 1988) has been dry during all sampling events except on May 29, 1991, when a very turbid water sample was collected. A groundwater monitoring well (TMW-15) was completed at the base of the tailing deposit in Little Dog Creek in July 1989. This well has been dry throughout the period of record. Groundwater monitoring wells located downgradient from existing waste dumps indicate that the dumps contribute low concentrations (less than one milligram per liter) of nitrates to groundwater. Groundwater quality below the Kendall Waste Rock Dump has otherwise remained unchanged. The conductivity of groundwater sampled below the Muleshoe Waste Rock Dump has doubled between 1990 and





1992. The primary constituent which has increased in concentration is sulfate. Calcium and magnesium concentrations have also increased. Construction of the waste rock dump in Little Dog Creek is not expected to degrade the groundwater within this drainage. The source of sulfate in groundwater below the Muleshoe Waste Rock Dump is likely gypsum dissolution rather than pyrite oxidation, due to the low concentration of pyrite in these ore deposits and the nature of the geology of the mine pits. Increases in dissolved calcium and magnesium concentrations also support the conclusion that gypsum in the waste rock is the sulfate source. The Muleshoe orebody was located within the Madison limestone, but was overlain by the Jurassic Piper Formation, which is known to contain significant amounts of gypsum. This overlying rock was moved to the Muleshoe Waste Rock dump. Several rock types occur within the Kendall Pit area, including Piper shale, Madison limestone, and Tertiary intrusive rocks. The Horseshoe orebody is located almost entirely in Madison limestone, with some associated intrusive rock. A characterization study of Horseshoe Pit waste provided with CR Kendall's application indicates that the waste rock has no potential for producing acid rock drainage. Due to the rock type to be mined at the Horseshoe Pit, no impacts to water quality are expected from the resultant waste rock.

Construction of the waste dump within the Little Dog Creek drainage will eliminate the need to block this drainage with a haul road (and permanent access road) as permitted under Amendment #4. The surface of the waste dump will function as this haul road.

Vegetation: Predominant vegetation units are grassland and Douglas fir/ninebark. The Little Dog Creek area proposed for disturbance contains historic tailing material derived from turn-of-the-century mining activity. This tailing material remains highly erodible, which restricts the establishment of vegetation. Placement of a stable material in Little Dog Creek Canyon would permit the establishment of vegetation in this drainage, and would avoid disturbance of a currently vegetated area.

Visual Impacts: The permitted waste dump location would be visible from state highways to the east of the North Moccasin mountains. Relocation of this dump in Little Dog Creek would reduce the visual impact of the dump.

#### ALTERNATIVES CONSIDERED AND DISMISSED:

Denial: If the dump relocation proposal were denied, the dump would instead be constructed in a previously undisturbed and more visible location. The deposit of historic tailing within the Little Dog Creek drainage would continue to erode, preventing establishment of vegetation and causing tailing deposition downstream. A road would have to be constructed through the tailing, requiring blockage of the stream channel and permanent maintenance of this constructed access road to public lands.

